Transmit 10/100/1000 Base-T Ethernet over one or two single mode or multimode fibers. The 5100 Series is full-featured with auto-sensing 10/100/1000 Mbps Ethernet port with Auto MDIX and full and half duplex support. And, of course, the signal fidelity you have come to expect from Fiberlink®!

Fiberlink®
5100 Series

10/100/1000 Base-T Ethernet over one or two single mode or multimode fibers.

CSI Communications Specialties, Inc.

World Headquarters
125 Comac Street
Ronkonkoma, New York 11779 USA
Tel: (631) 273-0404
Fax: (631) 273-1638
info@commspecial.com

commspecial.com

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Welcome

Thank you for purchasing Communications Specialties, Inc.'s Fiberlink® 5100 Series. The 5100 Series is used to transmit 10/100/1000 Base-T Ethernet over one or two single mode or multimode fiber optic cores. The Fiberlink 5100 Series automatically adapts to the highest level of performance supported by the device connected to the Ethernet port. When the connected device is a switch or a workstation that supports full-duplex, the Fiberlink 5100 adapts to the full-duplex mode and provides an effective 2000 Mbps bandwidth. When the connected device is a HUB or a workstation that supports only half-duplex, the Fiberlink 5100 adapts to half-duplex mode providing the nominal 1000 Mbps.

With high performance data transmission and easy installation, the Fiberlink 5100 provides the ultimate ISP network solution for FTTH (Fiber To The Home), FTTC (Fiber To The Curb) or for ISPs for FTTB (Fiber To The Building), and can also be utilized for small office network environments.

Features

- Auto-sensing 10/100/1000 Mbps Ethernet port with Auto MDIX
- IEEE 802.3, IEEE 802.3u, IEEE 802.3az, & IEEE 802.3z
- Full-duplex and half-duplex
- LEDs indicate Link Activity, Speed, Fault Detection/Collisions and Power
- Single mode & multimode versions available
- One or Two fiber versions available
- Compact design, wall mountable

Package Contents

- One Fiberlink® 5100 Series Unit
- This User's Manual
- Mounting Brackets

Technical Specifications

Model Part Number Specification

Fibers	Unit Type	Part Number	1000-Base-X
1	Single Mode or Multimode (1310/1490 nm)	5100-B7L	BX10-U
1	Single Mode or Multimode (1490/1310 nm)	5101-B7L	BX10-D
2	Single Mode or Multimode (1310 nm)	5102-B7L	LX/LH
2	Multimode (850 nm)	5102-B1L	SX

General Specifications

Maximum Speed (1000Base-Tx/Fx)	Full Duplex: 2000Mbps Half Duplex: 1000Mbps
Packet Forwarding Rate	14880pps@10Mbps 148800pps@100Mbps 1488000pps@1000Mbps
Cabling/Maximum Distance	See Optical Loss Budget & Maximum Useable Distance sections of this manual
Connectors	Copper: RJ-45(Auto-MDI / MDI-X) Fiber Optic: LC type
LEDs	TX: LINK/ACT, SPD, FD / COL FX: LINK/ACT, SPD, FD / COL Power
Launch Power/Receiver Sensitivity	1 Fiber SM: -8 dBm min / -23 dBm max 2 Fiber SM: -9 dBm min / -21 dBm max 2 Fiber MM: -9 dBm min / -18 dBm max
Power Requirements	Input: 100-240VAC, 50/60Hz Output: 12V/1A
Operating Temperature Range	0 to +40º Celcius
Operating and Storage Humidity	10% to 90% relative humidity (non-condensing)
Weight	2 pounds
Dimensions	4.25" x 3.14 " x 1.02" (108mm x 80mm x 26mm)

Technical Specifications

Optical Loss Budget & Maximum Useable Distance (cont.)

	5100-B7L	5101-B7L	5102-B7L	5102-B1L
1000-Base-	BX10-U	BX10-D	LX, LH, LH10	SX
Fiber Core & Type	1 SM or MM	1 SM or MM	2 SM or MM	2 MM
802 Distance Specification	SM 10km	SM 10km	MM 50u 550m SM 10km	MM 50u 550m MM 62.5u 220m
CSI Loss Budget	15dB min (pair)	15dB min (pair)	12dB min	9dB min
CSI Typical Distance*	1k MM 10km SM	1k MM 10km SM	1k MM 10k SM	1k

*Distance specifications are approximate, based upon connecting a 5100 Transmitter to a 5100 Receiver, and are not guaranteed. CSI cannot estimate or guarantee operating loss budgets when the 5100 Series is used with other, non-Fiberlink devices. Operating loss budget must not be exceeded.

Ethernet Cable

The Fiberlink 5100 Series is compatible with standard Category 3, 4 or 5 UTP cable. A category 5 cable consists of four pairs of wires; two pairs are used for 10/100 transmission. The RJ-45 connector consists of 8 pins which are used for 10/100 transmission as follows:

Pin	Designation	Function
1	TX+	Ethernet Differential Signal (+)
2	TX-	Ethernet Differential Signal (-)
3	RX+	Ethernet Differential Signal (+)
4	NC	Unused
5	NC	Unused
6	RX-	Ethernet Differential Signal (-)
7	NC	Unused
8	NC	Unused

*Note: All pairs/wires are used for gigabit (1000-Base-X) transmission.

Installation Instructions

The Fiberlink® 5100 Series of fiber optic transmission systems are ready for immediate use and do not require any special tools or equipment. However, an Optical Power Meter, such as the Fiberlink® 6615, can be useful in determining optical loss budgets during your systems design and maintenance.

The following instructions describe the typical installation procedure:

1) Connect the Universal Power Supply to the transmitter and receiver units. When power is applied, the PWR LED should illuminate, indicating the presence of operating power.
2) Connect any Category 3, 4 or 5 Ethernet Cable to the Ethernet port of the transmitting 5100 Series unit. The TX Link LED should illuminate.
3) Connect any Category 3, 4 or 5 Ethernet Cable to the Ethernet port of the receiver 5100 Series unit. The TX Link LED should illuminate.
4) Connect the fiber optic cable(s) to the transmitter and receiver units.
5) The FX Link LED should illuminate. If the FX Link LED fails to illuminate and you are using a two fiber system, reverse the fiber optic connections at one of the units.

The transmitting element in the Fiberlink® 5100 transmitter unit contains a solid state Laser Diode located in the optical connector. This device emits invisible infrared electromagnetic radiation which can be harmful to human eyes. The radiation from this optical connector, if viewed at close range with no fiber optic cable connected to the optical connector, may be sufficient intensity to cause instantaneous damage to the retina of the eye. Direct viewing of this radiation should be avoided at all times!

Indicator LEDs

General LEDs	Status	Definition
PWR	On	Indicates that correct power has been applied.

TX LEDs	Status	Definition
Link	On	RJ-45 Ethernet is linked
	Blink	RJ-45 Ethernet is active
SPD	On	Speed is at 1Gbps
	Blink	Speed is at 100Mbps
	Off	Speed is at 10Mbps
FD/COL	On	Full-Duplex
	Blink	Collision occured
	Off	Half-Duplex

FX LEDs	Status	Definition
Link	On	Optical fiber is linked
	Blink	Optical fiber is active
SPD	On	Speed is at 1Gbps
	Blink	Speed is at 100Mbps
	Off	Speed is at 10Mbps
FD/COL	On	Full-Duplex
	Blink	Collision occured
	Off	Half-Duplex

Operating Pointers

Remember to check attenuation of the fiber optic cable. The system will only operate properly if these specifications fall within the range of the system's loss budget.

Troubleshooting

Multimode fiber optic cable contains an optical fiber with a light carrying "core" that is only .0025 inches (62.5 microns) in diameter. Single mode fiber optic cable has an even smaller "core," only .00032 to .0004 inches (8-10 microns). This is smaller than a human hair! Therefore, any minute particles of dirt or dust can easily block the fiber from accepting or radiating light. To prevent this from happening, always use the provided dust caps when ever optical connectors are exposed to air. It is also a good idea to gently clean the tip of an optical connector with a lint-free cloth moistened with alcohol whenever dust is suspected.

The status of the LEDs should provide the first clue as to the origin of any operational failure. If these are off, it usually means that the fiber is broken or has too much attenuation. Next, be certain that the input and output signal connections are correct.

If the FX Link LED fails to illuminate and you are using a two fiber system, reverse the fiber optic connections at one of the units.

An optical power meter, such as the Fiberlink® 6615, a visible light source, such as the Fiberlink® 6610, and a Three Wavelength Light Source, such as the Fiberlink® 6620, can greatly assist and expedite troubleshooting of fiber optic transmission systems and are recommended tools all installers should have available.

Finally, although multimode and single mode devices may look the same, they will not operate properly together. Using the wrong device or fiber can easily add more attenuation than specified, resulting in poor overall performance. It should be noted that some of our fiber optic products support both single mode and multimode fiber in the same unit.

If, after reviewing the above possibilities, the system is still not operating, please contact the Customer Service Department for further assistance. If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

Maintenance and Repairs

The Fiberlink® 5100 Series has been manufactured using the latest semiconductor devices and techniques that electronic technology has to offer. They have been designed for long, reliable and trouble-free service and are not normally field repairable.

Should difficulty be encountered, Communications Specialties maintains a complete service facility to render accurate, timely and reliable service of all products.

The only maintenance that can be provided by the user is to ascertain that optical connectors are free of dust or dirt that could interfere with light transmission and that electrical connections are secure and accurate. Please see the Troubleshooting section of this manual for additional information.

An optical power meter, such as the Fiberlink® 6615, a visible light source, such as the Fiberlink® 6610, and a Three Wavelength Light Source, such as the Fiberlink® 6620, can greatly assist and expedite troubleshooting of fiber optic transmission systems and are recommended tools all installers should have available.

All other questions or comments should be directed to our Customer Service Department. It should be noted that many "problems" can easily be solved by a simple telephone call.

If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

Certifications

Communications Specialties, Inc. (CSI) warrants that, for a period of three years after purchase by the Buyer, this product will be free from defects in material and workmanship under normal use and service. A Return Material Authorization (RMA) number must be obtained from CSI before any equipment is returned by the Buyer. All materials must be shipped to CSI at the expense and risk of the Buyer.

CSI's obligation under this warranty will be limited, at its option, to either the repair or replacement of defective units, including free materials and labor. In no event shall CSI be responsible for any incidental or consequential damages or loss of profits or goodwill.

CSI shall not be obligated to replace or repair equipment that has been damaged by fire, war, acts of God, or similar causes, or equipment that has been serviced by unauthorized personnel, altered, improperly installed, or abused.

RMA numbers and repairs can be obtained from:

Communications Specialties, Inc.
125 Comac Street
Ronkonkoma, New York 11779 USA
Tel: (631) 273-0404
Fax: (631) 273-1638

RMA numbers can also be obtained from our web site: **commspecial.com**

Please have your serial number available.

Fiberlink® 6610 Visible Light Source

The Fiberlink® Visible Light Source provides a visible 650 nm laser output that can be used for identifying fiber breaks and individual fibers within fiber bundles, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures.

Fiberlink® 6615 Optical Power Meter

The Fiberlink® Optical Power Meter measures the power of optical signals at 850, 980, 1310 and 1550 nm wavelengths, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures. It can be used to measure the power of an optical signal reaching the receiving end of a fiber optic cable, as generated either by a transmitter unit or by a light source such as the 6620.

Fiberlink® 6620 Three Wavelength Light Source

The Fiberlink® Three Wavelength Light Source offers a laser output at wavelengths of 1310 and 1550 nm and VCSEL output at 850 nm, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures.

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World Headquarters
125 Comac Street
Ronkonkoma, New York 11779 USA
Tel: (631) 273-0404
Fax: (631) 273-1638
info@commspecial.com

commspecial.com

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